Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Caroline Verboog
Student number	4594126

Studio		
Name / Theme	Explore Lab	
Main mentor	Veerle de Vries	Architecture
Second mentor	Rufus van den Ban	Building Technology
Research mentor	Machiel van Dorst	Environmental psychology and Urbanism
Argumentation of choice of the studio	Choosing the Explore Lab studio, I am able to research my own specific fascination; that of the relationship between child psychology and architecture. Psychology and the functioning and reasoning of the human brain has always been fascinating to me. The brain is the centre of the body's nervous system and the source of cognition. It is responsible for everything we do, feel, and perceive. It receives information from sensory inputs and converts this information to make sense of the world, by comparing and integrating it with past experiences. The brain has the ability to create, store and retrieve memories, while also controlling movements to enable actions and communication. Over a century ago, the subject of child psychology has been introduced. Children perceive the world in a magical, imaginary way which is different from adults' perception of space and events. Researchers acknowledged the stakes of understanding the influences of the physical and social environment for the children's future development. The purpose of this carefully shaped environment is the promotion of the child's physical, psychological, and social development, as well as functioning as an educational space for the evolution of pedagogical processes. Child psychology and architecture should have a stronger connection to be able to regulate the physical and social interactions in children's lives.	

Graduation project

Title of the graduation project	Healthy architecture for children

Goal

Location:	Rijswijk/Delft, Netherlands
The posed problem,	The built environment has a significant influence on our health and well-being, and this is especially true for children's cognitive development. The architecture of schools and other learning environments can have a profound impact on how children learn, think, and develop academically, socially, and emotionally. However, despite the growing body of research on this topic, many schools and educational institutions continue to prioritize other factors, such as cost and convenience, over the potential benefits of high-quality architecture and design. The main problems facing this issue is the lack of understanding among architects, policymakers, and educators about the impact of architecture on children's cognitive development. There is a general perception that buildings are simply functional structures that need to be constructed as cheaply and efficiently as possible. This perspective often results in poorly designed buildings that do not consider the unique needs of children and their learning processes. Especially in educational buildings where children spent half of their day, it is important to comprehend how children perceive the world surrounding them in order to create a healthy environment for them to grow up in.
research questions and	How do school environments influence the development of children between the ages of 4 to 8 years old?
design assignment in which these result.	Designing an elementary school that promotes the development of children

Process

Method description

In order to get an understanding on children's behaviour and learning environments, fieldwork will be done at primary schools. Although on some aspects similar, various types of primary school educational systems in The Netherlands will be used as case studies. A Dalton school, a Freinet school and a Vrije School will be approached for research to get grip on this magical mind of children. All schools will have essential differences besides the educational system, such as size and children's background. As primary schools often host room for children between the ages of 4 to 12 years old, this age range will be divided into the age group 4-8

and 8-12. The main source of information will be in the age group 4-8 since they belong in the category of ages that has most influence on the development of children. The age group 8-12 could be analysed in future research.

The research will consist of 3 stages:
1. Literature Approach
2. Naturalistic Approach
3. Participatory Approach

At the end of the stages, the different approaches will be combined to determine how children use spaces, deciding on areas of continuity or areas of change, and what places do children see as important.

Stage one: Literature Approach (facts and figures)
Stage one will focus on facts and figures through literature. The architectural background will be approached, as well as the theory of psychology regarding a child's development. The relation between the social and physical environment and the influence of school design on the development of children will be reviewed.

Stage two: Naturalistic Approach (adult view)
The case study research will be divided into two approaches: passive and active. Stage two of the research will focus on the passive approach; I will seek to get an understanding of the world through the eyes of the child with my own viewpoint and observations. This will be done before prior to the active approach during site visit. By means of literature knowledge and background expertise, I will observe the relationship between children and their physical and social environment. Alongside my observation, conversations with parents and teachers could take place. This approach revolves around the exterior outlook, often an adult's, on children's day-to-day life.

Naturalistic observation focusses on the behaviour of participants in the environment where the phenomena occur. This enables me to see the children make choices and react to situations in their natural settings as opposed to structured interviews. The observations are made as unobtrusively as possible, by not interacting with the participants in any way.

Stage three: Participatory Approach (child view)
When doing research with children, traditional methods will not enable young children the possibility to express their 'voice'. Interviews may be too long and intense for children or they find it challenging to express themselves through verbal skills. I would like to find ways of harnessing young children's creativity and engagement with their world, while not over-simplifying approaches. Listening to children and retrieving information is a complex, multifaceted, and sometimes surprising process. Children should not be seen as incompetent and passive objects in research processes or society in general, but as social actors (Qvortrup et al, 1994). They have a unique body of knowledge about living in their environment in

comparison to adults in that same setting. The viewpoint of children as competent users and explorers of their surroundings leads to a distinct research method developed by researchers Alison Clark and Pete Moss; the Mosaic Approach. It represents the bringing together of different pieces – or perspectives - to create an image of the children's world using their strengths, local knowledge, attention to detail and, visual and verbal communication skills. Central in this approach is the question "What does it mean to be in this space?". This multi-method allows children with different abilities and interests to take part in the individual and collective process. The participatory approach treats children as the experts of their own lives and enables the children to communicate their feelings and opinions in verbal and nonverbal ways through formal and informal interviews, as well as planned and unplanned interactions.

Child conferencing opens the possibility to have formal conversations with children about their educational institution, in which they are considered the expert of the situation. These one to one or group interviews are conducted in a short, structured manner. In advanced prepared questions guide the conversations but they are not leading. The dialogue will have open questions with a focus on important people, places, and activities they enjoy doing, or find hard. A formal conversation can turn into informal exchanges between peers or me, or be conducted on the move as children take me to places they are talking about.

Not all children are interested in talking in formal conversations. For them, other tools, such as the **camera**, would be more convenient. This participatory tool allows children to communicate in playful and informal ways. It displays the silent voice of the children behind the camera. They can explore their competency with a camera to represent objects, as well as the context of the object, the space itself. Asking them questions before hand such as "What do you think is important at school? ", "What is your favourite area?", "What spot do you not like?". Giving children single use camera's provides children freedom without giving them adult anxiety about expensive equipment. Additionally, they can express pride through photographs, which is not always the case with drawings and paintings (Clark, 2011).

The tools of conferencing and usage of cameras can be combined with the tool of **onsite tours** directed by the students. They lead the way and decide what route we are talking and what they want to share about the space. This allows me to also observe the routes children take to go from one space to another and hear the different items or areas that does or does not stand out for each child. With this tool, children can point out subjects they are talking about in that specific moment, and I can witness the interesting look of children on their surroundings. Such tours can be done either individually, or with multiple children at the same time which allows them to have discussion amongst each other.

Literature and general practical preference

Books

Allen, B., & Hessick, K. (2011). The classroom environment: the silent curriculum. *Child Development*.

David, T.G., & Weinstein, C. (2013). *Spaces for Children: The Built Environment and Child Development*. Springer Science & Business Media.

Day, C. (2007). *Environment and Children* (1st ed.). Architectural Press.

Dudek, M. (2012). *Children's Spaces*. Routledge.

Dudek, M. (1996). Kindergarten Architecture (1st ed.). E & FN Spon

Kalvaiitis, D., & Monhardt, R. M. (2012). The architecture of children's relationships with nature: a phenomenographic investigation seen through drawings and written narratives of elementary students. In *Environmental Education Research* (2nd ed., Vol. 18, pp. 209–227). https://www.tandfonline.com/doi/epdf/10.1080/13504622.2011.598227?needAccess=true&role=button

Kopec, D. M. (2018). Environmental Psychology for Design. In *Bloomsbury Publishing Plc eBooks*. https://doi.org/10.5040/9781501316852

Rieh, S. (2020). *Creating a Sense of Place in School Environments: How Young Children Construct Place Attachment*. Routledge.

Siegel, T. J. (n.d.). Low Income Investment Fund. Quality Environments for Children. *A Design and Development Guide for Child Care and Early Education Facilities*. https://www.liifund.org/wp-content/uploads/2011/03/LIIF-Quality_Environments_for_Children-2010.pdf

Siegler, R. S., Saffran, J., Eisenberg, N., DeLoache, J. S., Gershoff, E., & Leaper, C. (2017).
How Children Develop (Fifth ed.). Worth Publishers.

Websites

Boul, B. (2019, January 17). *How Modern School Design Can Reduce Bullying | Ideas | HMC Architects*. HMC Architects. https://hmcarchitects.com/news/how-modern-school-design-can-reduce-bullying-2018-09-14/

Child development – Birth To 5 Matters. (n.d.-b). https://birthto5matters.org.uk/child-development/

Gieles, J. (2023, February 3). *De invloed van je jeugd*. Psychologie Magazine. https://www.psychologiemagazine.nl/artikel/de-invloed-van-je-jeugd/

Minero, E. (2018, March 2). *The Architecture of Ideal Learning Environments*. Edutopia. https://www.edutopia.org/article/architecture-ideal-learning-environments/

Pang, K. (n.d) *Toxic Stress: How the Body's Response Can Harm a Child's Development*. https://www.nationwidechildrens.org/family-resources-education/700childrens/2017/07/toxic-stress-how-the-bodys-response-can-harm-a-childs-development

Articles

Clark, A. (2005). Ways of seeing: using the Mosaic approach to listen to young children's perspectives. *Policy Press EBooks*, 29–50. https://doi.org/10.51952/9781447342403.ch003

Fox, S. E., Levitt, P., & Nelson, C. H. (2010). How the Timing and Quality of Early Experiences Influence the Development of Brain Architecture. In *Child Development* (pp. 28–40). https://doi.org/10.1111/j.1467-8624.2009.01380.x

Scott, S. (2010). *Architecture for Children*. Aust Council for Ed Research.

Shonkoff, J. P., & Garner, A. J. P. (2012). The Lifelong Effects of Early Childhood Adversity and Toxic Stress. *Pediatrics*, *129*(1), e232–e246. https://doi.org/10.1542/peds.2011-2663

Tol, Van Den, M. (2013). *Bij de Les!: Optimatie concentratie in een speelse omgeving* [Master Thesis]. Delft University of Technology.

Westberg, N. (2016). *Safe in School: When Architecture Tackles Bullying* [Master Thesis]. Chalmers University of Technology.

Yerger, W. M., & Gehret, C. (2011). Understanding and Dealing With Bullying in Schools. *The Educational Forum*, *75*(4), 315–326. https://doi.org/10.1080/00131725.2011.602468

Reflection

With this research, I am seeking to build a bridge between child psychology and architecture. A positive learning environment has a considerable impact on a child's mental and emotional well-being. Studies have shown that children who learn in an environment that is conducive to their learning, such as a well-lit and ventilated classroom with comfortable furniture, perform better academically than those who do not. Societally, the importance of improving elementary buildings cannot be overemphasized. The environment in which children learn has a direct impact on their cognitive development and future academic success. A well-designed learning environment, in which students feel comfortable, supported, and stimulated, helps to foster a love for learning and a positive attitude towards school. This, in turn, leads to increased academic achievement, reduced dropout rates, and a better chance for students to succeed in their future careers. By investing in the improvement of elementary buildings, we can ensure that our children are learning in safe and healthy environments that promote their overall development. By investing in our children's learning environments, we are investing in their future success and the future success of our society as a whole.